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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,277	12/31/2003	Tac-wan Kim	249/409	6602

7590 12/07/2005

LEE & STERBA, P.C.
SUITE 2000
1101 WILSON BOULEVARD
ARLINGTON, VA 22209

EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT PAPER NUMBER

1763

DATE MAILED: 12/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/748,277

Applicant(s)

KIM ET AL.

Examiner

Luz L. Alejandro

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1203</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4, 11-12, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al., WO 00/00993.

Chen et al. shows the invention as claimed including an inductively coupled antenna 600 for installation on a reaction chamber of an inductively coupled plasma processing apparatus and for connection to a radio frequency power source to induce an electric field for ionizing a reactant gas injected into the reaction chamber and for generating plasma, the inductively coupled antenna comprising a coil having a plurality of turns including an outermost turn and a plurality of inner turns, wherein a current flowing through the outermost turn is larger than a current flowing through the plurality of inner turns as adjusted by the capacitors (see fig. 6 and its description).

With respect to claims 2 and 12, the outermost turn and the plurality of inner turns are connected to the RF power supply in parallel and the plurality of inner turns are connected to each other in series.

Regarding claims 4 and 14, the plurality of turns are concentrically formed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al., WO 00/00993.

Chen et al. is applied as above but does not expressly disclose wherein a sum of the lengths of the plurality of inner turns is longer than a length of the outermost turn. However, a prima facie case of obviousness exists because, where the only difference between the prior art and the claims was a recitation of relative dimensions of the apparatus and an apparatus having the claimed relative dimensions would not perform differently than the prior art apparatus, the claimed apparatus is not patentably distinct from the prior art apparatus.

Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al., WO 00/00993 in view of admitted prior art.

Chen et al. is applied as above but does not expressly disclose wherein the plurality of turns is formed of a single conductive line. Admitted prior art discloses an antenna with a plurality of turns that is formed of a single conductive line (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Chen et al.

so as to form the coils from a single conductive line because the admitted prior art shows that it is well known in the art to form a coil comprised of a plurality of turns from a single conductive line.

Claims 6-10 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al., WO 00/00993 in view of Benzing et al., U.S. Patent 5,346,578 and Ni et al., US 2003/0106645 or Chen et al., US 2002/0140359.

Chen et al. is applied as above but does not expressly disclose a copper tube having a cooling path and a conductive metal strip that is electrically and thermally connected to a lower portion of the conductive metal tube. Benzing et al. discloses a copper tube having a cooling path (see fig. 3 and col. 4-lines 40-60). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Chen et al. so as to have a cooling path because in such a way the antenna will be prevented from high temperature damage.

Chen et al. and Benzing et al. do not expressly disclose a conductive metal strip. Ni et al. discloses a conductive metal strip 64 extending from the antenna (see figs. 4-5 and their description). Alternatively, Chen et al. discloses a strap 117 with a height that gradually decreases from a center portion to an edge portion of the antenna (see fig. 2 and its description). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Chen et al. modified by Benzing et al. so as to include a conductive metal strap because such a strap provides suitable leads for the antenna.

Art Unit: 1763

Concerning the particular shape of the conductive metal tube and conductive metal strip, the configuration of the claimed conductive metal tube and strip is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed conductive metal tube and strip is significant.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1763

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Luz L. Alejandro
Primary Examiner
Art Unit 1763

November 28, 2005